

What is claimed is:

1. A method for fitting a surface to a point group
using a computer, comprising the steps of:

5 a first step for judging reliability of the point
group and

 a second step for changing the method for fitting
the surface to the point group based on a result of the
judgment of reliability obtained in the first step.

10 2. The method according to claim 1, wherein
 the first step comprising judging reliabilities of
points composing the point group, and

 the second step comprising changing the method for
fitting the surface to the point group by varying a weight
of each of the points based on the reliability of each of
15 the points.

3. The method according to claim 1, wherein
 data indicating reliabilities of the point group and
the points are obtained by three-dimensional measurements.

20 4. A device for fitting a surface to a point group
using a computer, comprising:

 an obtaining section for determining reliability of
each of points composing the point group and

 a modifying section for varying a degree of the
fitting of the surface to the point group depending on the
25 reliabilities.

5. The device according to claim 4, comprising:

 a weighting section for assigning a weight for each
of the points based on the reliability of each of the
points, wherein

30 the modifying section changes a degree of the

fitting of the surface to the point group depending on the weights.

6. The device according to claim 4, wherein
the surface has been prepared in advance of the
5 fitting.

7. The device according to claim 4, wherein
an amount of data for the surface is smaller than
that of the point group.

8. The device according to claim 4, wherein
10 the data of the surface includes attribute
information associated with form information.

9. The device according to claim 8, wherein
the data of the surface represents a form of a face,
and the attribute information represents characteristic
15 parts of the face.

10. A system comprising:
a measuring unit for measuring a distance therefrom
to a plurality of points on a surface of an object;
a calculator for calculating reliabilities of
20 respective distances of the measured distances;
a processor for modifying prepared data which
represents a three-dimensional form using the
reliabilities so that a three-dimensional form represented
by the modified data resembles a form of the object.

25 11. A computer program for fitting a surface to a
point group that enables a computer to perform the steps
of
a first step for judging a reliability of the point
group and
30 a second step for changing the method for fitting

the surface to the point group based on a result of the judgment of reliability obtained in the first step.

12. A processor comprising:

an obtaining section for obtaining original data

5 generated by measurements;

a first modifying section for modifying a first standard model based on the obtained data, the first standard model being previously prepared independently of the obtaining of original data;

10 a second modifying section for modifying a second standard model based on an effect of the modification of the first standard model, the second standard model being relative to the first standard model.

13. The processor according to claim 12, wherein

15 the first standard model is a model for skin and the second standard model is a model for skeleton or a model for muscle, the original data being data whose object is a surface of a human head.

14. The processor according to claim 12, wherein

20 the first standard model has a plurality of construction points corresponding to which a plurality of control points are defined;

25 the second standard model has a plurality of construction points corresponding to which some of the control points defined by the first standard model are defined;

the first standard model is modified in accordance with movements of the construction points which move in accordance with movements of the control points; and

30 the second standard model is modified in accordance

with movements of the construction points which move in accordance with movements of the control points.

15. The processor according to claim 14, wherein
the control points for moving the construction
5 points of the second standard model are corrected when
adopting a result of the modification of the first
standard model.

16. The processor according to claim 14, wherein
defined as control points corresponding to the
10 construction points of the second standard model are
control points corresponding to construction points among
the construction points of the modified first standard
model which are the closest to the construction points of
the second standard model.

15. The processor according to claim 14, wherein
defined as control points corresponding to
construction points of the second construction points are
control points corresponding to points obtained by
projecting the construction points of the second standard
20 model on the first standard model.

18. A process comprising the steps of:
obtaining original data generated by measurements;
modifying a first standard model which has been
prepared separately from the obtaining of the original
25 data based on the obtained original data; and
modifying a second standard model corresponding to
the first standard model based on a result of the
modification of the first standard model.

19. The process according to claim 18, wherein
30 the first standard model has a plurality of

construction points, and a plurality of control points are defined corresponding to the construction points;

the second standard model has a plurality of construction points and some of the control points defined

- 5 by the first standard model are defined corresponding to the construction points;

the first standard model is modified in accordance with movements of the construction points which move with the control points move; and

- 10 the second standard model is modified in accordance with movements of the construction points which move with the control points move.

20. A processor comprising:

an obtaining section for obtaining original data

- 15 generated by measurements;

a storage section for storing a first data representing a standard skin model of a human head and a second data representing a standard skeleton model or a standard muscle model of the human head, the first data

- 20 and the second data are corresponding to each other; and

a processing section for modifying the first data and the second data so that the standard skin model and the standard skeleton model or standard muscle model fit with the measured surface form.

- 25 21. A computer program for modeling, which enables a computer to perform the steps of:

obtaining original data generated by measurements;

modifying a first standard model which has been prepared separately from the obtaining of the original

- 30 data based on the obtained original data; and

modifying a second standard model corresponding to the first standard model based on a result of the modification of the first standard model.

22. A device for modifying a surface based on a three-dimensional point group comprising:

a selection section for selecting a plurality of partial areas from the point group and

a modifying section for modifying a surface based on a point group of each of the selected partial areas.

10 23. A method for generating a three-dimensional model comprising:

selecting a plurality of partial areas from measurement data obtained by measuring an object and modifying a three-dimensional model based on the measurement data of each of the selected partial areas.

15 24. A modeling device for generating a three-dimensional model comprising:

a selection section for selecting a plurality of partial areas from measurement data obtained by measuring an object and

a modifying section for modifying a three-dimensional model based on a measurement data of each of the selected partial areas.

25 25. The device according to claim 24, wherein

the modifying section performs modification with respect to the standard model based on the whole measurement data before performing modification based on the measurement data of each of the partial areas.

26. The device according to claim 24, wherein

30 control points for modifying the standard model is

defined on the standard model, and

at least one of the control points, reduction rate
for reducing a number of measurement data and evaluation
function for determining a degree of modification of the
standard model is changed.

27. A computer program for generating a three-dimensional model that enables a computer to perform steps of:

- selecting a plurality of partial areas from
10 measurement data obtained by measuring an object; and
- modifying a three-dimensional standard model based
on measurement data of each of the selected partial areas.